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ABSTRACT

The principal purpose of this publication is to present a selected review and synthesis of the literature on the reading process. Section one describes an overview of the reading process. Various models of reading acquisition and their implications for reading are presented in section two. Section three considers a number of practical elements necessary when planning the classroom programs, K-12. Among the topics discussed are: learning to read, two definitions of reading, the value of reading, the nature and purposes of language, language as a vehicle of communication phonemes, morphemes, nativistic models, cognitive models, syntactic models, semantic models, developing the cognitive structure, developing comprehension processes, and accomplishing declared reading goals. An extensive bibliography is included. (TS)

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Reviews of Research

THE READING PROCESS:

A SELECTIVE REVIEW OF THE LITERATURE

No. 3

September 1975

Maryland State Department of Education
Division of Research, Evaluation, and Information Systems
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PREFACE

When discussing the problems of the teaching of reading, many educators and psychologists agree that the first step in solving such problems must be an understanding of the reading process. "The Reading Process: A Selective Review of the Literature," a continuation of the series, Reviews of Educational Research, issued periodically by the Division of Research, Evaluation, and Information Systems, is intended to bring together, in convenient form, a selected review of the literature on the reading process.

The issue was written by Phyllis M. Sunshine under the direction of Richard M. Petre, Consultant in Reading.

We hope that educators will find the Reviews valuable. The Department also hopes that readers will suggest ways to make the series more useful and will recommend topics for inclusion in future issues.

JAMES A. SENSENBAUGH
State Superintendent of Schools

INTRODUCTION

The Division of Research, Evaluation, and Information Systems of the Maryland State Department of Education annually prepares reviews on pertinent research and theory that might be helpful to the educational community in the improvement of educational practices. The past two issues have focused on psychological factors, such as feelings of alienation which may cause a child to manifest behaviors which are difficult for the classroom teacher to manage. Other factors which may cause behavior maladjustments are due to frustrations in the learning situation. The need for successful achievement at all levels is fundamental to normal personality development. When there is severe reading retardation, personality difficulties may arise.

Frustrations due to reading failures may manifest themselves in several ways. The child may compensate feelings of inferiority by being rebellious and aggressive. On the other hand, he may retire from active classroom participation and daydream. Continued frustration in a learning situation was recognized early as leading to excessive absenteeism and juvenile delinquency (Gates & Bond, 1936, Fendrick, 1935; Polmantier, 1941). In general, children with severe reading disabilities tend to have concomitant adjustment problems. Although we do not know which factor is the cause or effect in the relationship, remediation of a child's reading disability tends to improve his personal and social adjustment (Bond & Tinker, 1972).

Reading is generally considered one of the most important subjects taught in the elementary school. Proficient reading is an essential tool for learning

an increasingly large amount of knowledge throughout the successive school levels. Since our world is essentially a reading world, it is difficult to find any activity, in school or out, that does not demand reading. People read to gain information, follow directions, locate references, understand forms, and for personal development (Maryland State Department of Education Functional Reading Goals, 1974). Today, reading with understanding is a necessary activity in order to succeed in life's daily activities.

It is important for the reader to remember that the reading process is a highly complex one. Although disciplines such as psychology, education, and psycholinguistics have made important contributions to our understanding of reading, each uses its own frame of reference and terminology. It is equally important to remember that the ideas presented here are a combination of scholarly opinion, hypotheses, parts of comprehensive theories relating to the reading process, and the actual findings of empirical investigations. The views presented in this volume, although promising, are still not firmly established. Consequently, these ideas are tentative and need testing and further refinement. Inclusion here of any theoretical position should not be construed as an endorsement by the Maryland State Department of Education.

The principal purpose of this publication is to present a selected review and synthesis of the literature on the reading process. Section One describes an overview of the reading process. Various models of reading acquisition and their implications for reading are presented in Section Two. Finally, Section Three considers a number of practical elements necessary when planning the classroom reading program, K-12.

Section I: What is the Reading Process?

Reading is obviously a major educational concern. Much time is devoted to it in the elementary curriculum. Parents and teachers are concerned with the progress their children make in learning to read. Slow progress in reading often is blamed on conflicts between parent and child, between child and peers, or between teacher and child. This chapter will examine what is involved in the reading process and the differences between fluent and beginning readers.

Learning to Read

Over the past years there has been considerable disagreement among educators and psychologists as to the best method of teaching children to read. For example, the controversy over the use of the whole-word versus the phonetic methods has been raging since the turn of the century (Huey, 1908). Sometimes, only silent reading has been advocated, while at other times only oral reading has been encouraged. Similarly, the language experience procedure was used in the early 1900's, abandoned a decade later, then revived again in the 1960's as a new procedure. Today, different aspects of the learning to read process are initiated at different times in various basal reading programs that integrate the many approaches. Differences and controversies are endless and are due simultaneously to the uncertainty about the superiority of certain methods and about what reading really is.

Often the reading process has been viewed as a confusing or even an unknown process. During a recent conference on applied linguistics (Michigan Conference on Applied Linguistics, 1971), several investigators stated in varying ways that no one understood the reading process. To that point, Jenkinson (1970) noted: "After 75 years of research and investigation there [still] has not emerged a coherent construct within which we can examine reading (p. 55)."

Two Definitions of Reading

Due to the minimal attention given to the reading process in the past, reading was often depicted as a passive and unitary activity. The perceiver was able to comprehend the reading material solely by determining the

organization or patterns of letters (Drake, 1962; Vernon, 1958). Starch's (1927) description of the reading process is typical of those who characterize reading as a passive process:

1. First, there is reception upon the retina of the stimuli from the printed page.
2. Second, there is a transmission of the visual impression from the retina to the visual centers of the brain.
3. Third, there is an arousal of association processes whereby the incoming impulses are interpreted.
4. Fourth, the impulses are transmitted from the visual centers to the motor-speech centers which direct the muscles of the vocal cords, tongue, and lips to respond in speaking words.
5. Finally, when the total process is completed, comprehension is completed.

Despite the fact that new information apparently has not been widely disseminated, some important contributions in this area have been made. Beginning in the middle sixties, the trend moved toward construction of theoretical models to represent those processes at work within the reading process.

Although researchers are still not in agreement as to any clear-cut definition of reading, many workers in the field are attempting to define reading by using psycholinguistic bases. Accordingly, reading is considered an active process whereby meaning is gained from a sentence. It is not serial processing--sounding out or recognizing letters or words one by one. This is not even a necessary process; fluent readers do not use it. Reading

skills should be taught in an integrated fashion rather than teaching these skills in isolation.

What is Good Reading?

Di Vesta (1974) stated that reading involves three components: the input (the symbols on the page); the readers' cognitive structure (the readers' immediate and long-term experience); and a strategy for linking the two (the transformational processes for arriving at the base structure of what is being read). Good readers, Ryan and Semmel (1969) concluded, process print in a manner which reflects their use of language. Expectancies about syntax and semantics within context lead to hypotheses which either can be confirmed or not confirmed with only a small portion of the cues available in the text. Thus, not all the information needed by the reader is on the printed page--nor are all the printed details needed by him. Ryan and Semmel viewed reading as an active process in which the reader forms and tests hypotheses about the information in the text rather than passively reacting to written forms unit by unit (letter or word).

Similarly, Cromer and Wiener (1966) conceptualized the reading process in the following manner. They stated that reading skill requires that the individual be able to utilize the partial information or cues derived from scanning the printed material and have available patterns of responding to these cues which are congruent with the pattern of occurrence within his own language (p.). Further, Kempler and Wiener (1963) stated that "Reading appears to involve not only the systematic scanning and identification of part of the cues but also the 'elaboration' of these cues based upon highly learned patterns of sequential occurrences" (of words, or what are called

"previously learned co-occurrence probabilities (p.352)." To read effectively, there must be a match or agreement between the cues available and the response characteristics of the individual. When no match is readily available or when there is a mismatch, reading will be less adequate.

Cromer and Wiener (1966) also noted that scanning, or the use of only part of the available information, is involved in nearly all reading beyond the most elementary level. In other words, the reader no longer needs to depend upon each letter and each word to reproduce what is produced. Even during the acquisition stage, when the reader may read word by word, the child probably will not process words letter by letter. Although these young readers will "say" individual words, often aloud or to themselves, they will utilize word meanings they already have available in their auditory language. Gradually they need to learn to organize their reading input into groups of words or what Gibson (1965) called "higher order units," which act as cues to meaning with or without minimal intermediate verbal-auditory transformations.

If an accomplished reader focuses only on a succession of single words rather than on some larger units, comprehension of the material will suffer. Lefevre (1964) noted this in a warning that an overemphasis on words may lead many readers to read "word-by-word or by pattern fragments without regard for whole structural patterns that carry meaning. This upgrading (overemphasis) may thus contribute to the frequency and extent of serious reading disability among pupils of all ages (p. 18)." Thus, Lefevre also emphasized that units must be based on some criterion of meaningfulness. Readers with good

comprehension skills are assumed to organize their reading material in units larger than the single word and thus no longer utilize the same identification skills as were emphasized when they were learning to read.

Reading, then, involves rapid scanning and guesses as to the meaning. As the reader proceeds, words contribute to the meaning of phrases and the phrases contribute to the meaning of sentences (thoughts). If this process does not make sense, the reader may then make regressive fixations (looks back) at other words that enable him to restructure the sentence's meaning which again indicates that the reader processes the meaning of the sentence as a unit rather than one word at a time.

Fast reading is essential because short-term memory (STM) holds material only a short time without continuous rehearsal. Slow reading strains STM. By the time a slow reader reaches the end of a sentence, he has forgotten its beginning which he needs for understanding. Educators need to be wary of reader techniques which place considerable stress on precise mechanics of letter and word recognition rather than comprehension. Too often, beginning readers are taught to read each word and are corrected for oral mistakes without regard to the kind of error made. After considerable reinforcement from teachers, habits associated with such techniques are very difficult to break.

Readers Do Contribute to Reading

Goodman (1970) contended that the reader contributes as much to reading through his cognitive structure as the written symbols. The fluent reader, because of his vast language background, may substitute words, paraphrase sentences, skip many words, and use only fragments of letter or word features to comprehend material. Compared to the less fluent reader, the fluent reader

is more efficient in his use of fixations and makes fewer regressive fixations. These processes are affected by what the reader knows about syntactical construction and about the content of the message.

Readers often contribute varying styles to reading; that is, there are many individual variations among even fluent readers. First, there are individual differences in reading rate. Some readers adapt their rates according to the difficulty of the material, while others read all material at the same rate. Second, there are differences in the degree which readers elaborate on reading material; some freely elaborate and add their own meanings to what they read, while others read for the literal sense of what the author said. Third, there are individual differences in the mechanical aspects of reading: in fixations; scanning strategies; dependence on the visual aspects of letters, words, or sentences; and in focusing on relevant rather than irrelevant material. These and other reading styles relate the material to the readers' cognitive structure. In general, reading style depends on the reader's conception of reading. If one has been taught to read letters and words without error, he will read slowly with short fixations. However, if one has been taught that reading is gaining meaning, he will probably scan and use information processing techniques (e.g., strategies and hypotheses testing).

Section II: Models of Reading Acquisition

In this chapter, we shall examine various models of reading acquisition as viewed by theorists in developmental psychology, psycholinguistics (i.e., psychology of language), and information processing to see what implications their models have for the teaching of reading. Because reading acquisition models are intimately involved with language, the first section will deal with the nature and purpose of language--as a communication vehicle, as a series of language units, and as a structural system. Some models incorporate one of these natures or purposes of language, while others incorporate more than one of the purposes. In the second section, models of reading acquisition will be discussed which have emphasized at least one of the natures or purposes of language.

The Nature and Purposes of Language

How a scientist views language depends on his objectives, which are in turn related to his field of interest. For example, Lenneberg (1969) viewed language as a structural system by examining the evidence for innate biological capacities in the acquisition of language rules. Gardner and Gardner (1971) and Premack (1971) viewed both the structural aspects and communication aspects of language by studying the means by which chimpanzees can be taught to acquire vocabulary, sentence structure, and logical relationships through contrived communication devices. Others, such as Bloom (1970), Brown (1973a, 1973b), and McNeill (1971), have been concerned with all aspects of language (communication, units, and structural systems) as they studied the acquisition of one's first language. Each of the purposes of language will be discussed separately.

Language as a Vehicle of Communication

Although other creatures, such as bees, use language as a communication vehicle, their language lacks three features which make human language unique, expandable, and flexible (Ervin-Tripp, 1964). These features are: a) the combination and recombination of a limited number of elements; b) the creation of arbitrary meaning for an event according to social agreement, and c) the reference to past objects or events and to abstract concepts.

The first feature, combination and recombination of elements, allows humans to create sounds, words, and grammatical parts according to rules. For example, we are the only creatures who can compose sentences that have never been uttered before. The second and third features allow us to invent

new terms or invest new meaning to old terms which are accepted by various social groups. For example, with the advent of space exploration, all language communities (e.g., English, Russian) invented new vocabulary to explain the event. Because of feature three, language communities were able to speak of the space events which were occurring in distant places and which were not always tangible. Unlike lower animal communication, human communication can function both concretely and abstractly in the present, past, or future tenses.

Language Units

The structural linguist analyzes language into its basic components. Although there is considerable disagreement over what the units are, two types of units receive the most attention--phonemes and morphemes.

Phonemes. These units have been characterized as bundles of mutually exclusive sounds (Hamp, 1967). They have

> . . . no intrinsic meaning of their own; they are merely the smallest contrasted units that can be isolated in a stream of speech. They may be likened to bricks which, though each has its own color, consistency, and character, may be put together to build a wall, a sewer, a well, and even a statue (p. 12).

The notion of bundles of sounds was explained by DeCecco (1968) as he noted that in English, p has four sounds:

> . . . a breathed p appears at the beginning of words like peace, an unbreathed p occurs in words such as spit and span, an exploded p occurs in a word like cup; and a glottalized p is heard when we say the word peace immediately after we have taken a drink of water (p. 370).

Each of these p sounds is distinct, but in English we have bundled these sounds together into one phoneme for p. That is, we recognize all four sounds as variants of p. All known languages use between 12 and 80 phonemes and in English (depending on dialect) we use between 40 to 45. However, nine English phonemes account for 50 percent of the spoken language.

Morphemes. These units are made of phonemes and convey meaning. Carroll (1964) noted that morphemes occur in many forms but cannot be divided into two or more forms. Carroll used the following examples: In the words houselight and unreconstructed, the morphemes were house, light, un, re, construct, and ed. There are two types of morphemes; free-form, which can stand along (e.g., fish, gold, and goldfish); and a bound-form, which cannot stand alone (e.g., un, struct, and con). Generally, free-forms are words, but not all words are free-form. For example, "the" is a word, but it cannot stand alone. Also, "the door" is not a single word, but it is a free form.

Traditionally, linguists examined how morphemes combine in various ways to produce a syntax of the language. By studying such rules, the linguist strove to describe the basic structure of the language. Currently, however, linguistic theory sees a very different relationship between basic language structure and grammar, as can be seen in the following discussion of the structural system.

Language as a Structural System

Modern linguists and psycholinguists no longer analyze language in its constitutent parts, because this type of analysis obscures aspects of the language. Native speakers, for example, can understand relationships between sentences which may be quite different in structure. Gleason (1965) noted that native speakers will match the following sentences with little difficulty and in the same way as other native speakers:

How are you?	My name is Tom.
What is your name?	It is five o'clock.
Did you go to the movie?	I am feeling fine.
What time is it?	I went to the movie.

The relationship of these sentences depends more on grammar than on meaning. These sentences are related by rules called transformations. All the rules or transformations for the English language link together large sets of sentences.

The idea of a transformational grammar was proposed by N. Chomsky (1957), who tried to explain why native speakers are able to speak sentences they have never seen or heard spoken. Transformational grammar assumes language is a system of rules that makes possible the formation and comprehension of language. Knowledge of the language is based on the intuitive mastery of the rules. These rules are used at all levels of language production: the production of unique sounds (phonemes), the combination of sounds into words (morphemes), the linking of words into phrases, and the linking of phrases into sentences.

Language can be described as a set of rules for placing words into noun phrases, verbs, auxiliaries, and predicate phrases. There are rules, productive rules, which determine changing active sentences into negative sentences. There are rules for determining when to use a word as a noun ("The permit is dated for 1975."), or as a verb ("Permit me to help."). Which rules we use depend on what meaning we wish to convey. As Bember and Jenkins (1970) contended ". . . language is 'computed' rather than 'stored' and this is what accounts for our tremendous capacity to utter novel but appropriate sentences and to understand new sentences when we hear them (p. 463)."

Models of Reading Acquisition

As noted in Chapter 1, reading is a complex process involving the syntheses of many skills. Because of its complexity, many researchers have attempted to show the components of the process more clearly by building reading models. Kingston (1966) noted that since the exact components of the reading process are undecided, the model approach has two advantages. First, observations concerning the reading process can be ordered so as to permit an understanding of underlying relationships between the various components. Second, what is scientifically known can be distinguished from what is inferred or believed; that is, reading models function not only as a method of specifying the components of the reading activity, but also as a technique for generating testable hypotheses.

Before examining the models, it is important to note that reading processes and reading instruction may not be as related as desired. Indeed, the premise on which the literature search of the Right-to-Read program is based has been

well-summarized by Frank Smith (1971):

> The current instructional methods are probably not much inferior to the methods we shall develop as we learn more about learning to read. So many instructional methods have been tried, and so many succeed (in some instances at least), that further permutations in the game of instructional roulette are unlikely to produce any great gain, either by chance or design. What will make a difference is an understanding of the reading process (p. vii).

No attempt will be made in this section, therefore, to prescribe exact methods or techniques for teachers. Although implications will be drawn, it is more important at this point to develop the understanding of all the elements--cognitive, perceptual, affective, linguistic and others--involved in this complex process before we can totally integrate theory and instructional practice.

The following models all incorporate at least one of the purposes of language. However, the model-builders orientations are very different and even have contradictory implications for reading; therefore, each model will be discussed separately.

Developmental Models

Behaviorist Models. Although behaviorism has been under considerable attack by psycholinguists and cognitive psychologists, behaviorists are convinced that learning is a function of conditioning. Accordingly, they assert that principles such as a "critical period for learning to read" are irrelevant. A teacher may build on the child's existing language skills so as to include reading at any point by utilizing reinforcement processes in sequential steps in order to help the child learn new generalizations,

discriminations, and mediating responses. Staats (1964) recommended that reading be taught earlier in the educative process, but developed gradually through the primary grades by a series of small steps. Staats (1964) has experimented with the type of reinforcements which are needed to facilitate the learning-to-read process. He found that extrinsic rewards such as candy or tokens were necessary to entice three-year-olds to participate in reading programs. On the other hand, Harlow (1965) concluded from his studies on curiosity that intrinsic rewards are more effective for school learning. To incorporate these two findings, Bloom (1971) suggested that continuous extrinsic reinforcement be used in the early stages of learning to read and gradually replaced by intermittent use of the extrinsic reward until reading acquires intrinsic reward value. Regardless of the schedule of reinforcement used, all investigators emphasize that the students' individual differences in reinforcement be considered.

The structure of the reading material is also important in this model. It is possible through manipulating the material to evoke the proper responses. Material should be ordered from the simplest to the most complex. First, the discrimination of individual letters must be accomplished, followed by the mastery of words, phrases, and sentences. Under this system, the teacher must have complete knowledge of the child's skills at all points in the reading program, as well as behavioral goals which the child is to master.

Carroll (1970) asserted that a child must know the language he is going to read and must be able to reason and think about what he reads. Such a language requirement implies that a child who doesn't have a fluent grasp of the language to be used in the reading program must either be taught the language

or the reading material must use the child's language (or dialect). Carroll's second requirement, reasoning, requires that the material to be read conveys information which is to be processed and acted upon. Since operant materials are usually programmed, it is easy to incorporate activity on the part of the learner. It appears that, although the behavioral model has not been able to totally meet the challenges posed by psycholinguists, this model has potential applications to reading, provided that: a) goals are clearly specified, b) the materials are meaningful, and c) the child's reasoning powers are challenged by these materials.

Nativistic Models. These models place heavy emphasis on the notion of critical periods for learning skills such as language (Lenneberg, 1969). According to Lenneberg (1969), the most critical periods for cognitive development occur between the ages of eight months to four years. If the contention that there is a direct relationship between a child's language and his acquisition of reading (Carroll, 1970; Downing, 1969; Gibson, 1970; Kagan, 1970) is correct, then deficiencies in language development would result in reading deficiencies. Therefore, early intervention programs involving language are critical for children who do not receive adequate language training in their early years.

Current programs in language intervention generally begin with children who are four-years-old. Since the critical period for language development is before this age, these programs are not reaching children during the time of the maximum language growth period. As Scott (1968) noted, experiences necessary during the critical period may have different consequences or no consequences before and after the critical period.

Although the nativistic modelers do not specify the type of intervention programs to implement, extrapolations from the theory would indicate that natural-language environments like those experienced in the home would be most desirable. Programs such as the Bereiter and Engelmann approach, which only induce artificial language, have been criticized. For example, Moskovitz (1968) asserted that the Bereiter-Engelmann program neither conceives of language as a communication process nor considers the relationship between language and thought.

Cognitive Models. Piaget is one of the leading developmental-cognitive theorists. He suggested that abstract symbols such as those used in reading are meaningless to children unless they have had many concrete experiences. For the young child, thinking about the multidimensional aspects of events and objects is a very difficult process, especially the notion that labels are names for classes, not single objects. Reasoning abilities develop slowly; and according to Piaget, new experiences cannot be assimilated until the child has the requisite cognitive experiences or cognitive structures. This theory would suggest that reading in the sense of learning phoneme-grapheme correspondences should be delayed at least until the child has reached the concrete operations period (7-11). However, this does not imply that the child cannot learn prior to this stage; it does imply that given a "good environment" the child can begin to lay the foundation for an understanding of the purpose and meaning behind the mechanical act of reading.

Attacks on the schools for their obsessions with reading have been made by Piagetian theorists (Furth, 1970). According to these theorists, educators have placed too much emphasis on reading to the exclusion of other activities

involving thinking. Since reading is an abstract way to represent thinking, children provided with experiences which challenge their thinking will probably not find learning to read such a tedious or anxiety-producing process. The implication is that reading should be introduced gradually and naturally as a tool to aid thinking and communication. "In this respect, there is a parallel between learning language and learning to read (Athey, 1971, p. 90)." Several schools have developed this parallel and use an integrated day approach that involves both reading and language.

Piagetian theorists often discuss the problem of developing the proper enriched environment for young children. Krech (1969) concluded that language behavior must be included in any program for developing an enriched environment. For this reason, he encourages educators to turn to the psycholinguist and cognitive psychologist for guidance in designing early childhood enrichment programs. In other words, the activities developed in the early childhood programs have direct bearing on later reading instruction. Reading is a cognitive activity involving a search for information and meaning. The child who has developed the necessary cognitive structures will perceive reading as a tool to acquire new information. This perception can be fostered by developing language competency as well as cognitive competency. The critical issue then is this: how the young child can best spend his early years? It may be possible by programming and repetition to induce recognition of printed symbols which will give a semblance of "reading," but until the child can understand what is read, this semblance is only verbalization.

Psycholinguistic Models

Phonological Models. These models postulate that there is a natural

order for the emergence of sounds and this order is found in all language (Jakobson, 1968). Furthermore, difficult phonemes are rare and even non-existent in many languages (McNeill, 1968). No such correspondence exists in English between frequency and difficulty. Common words such as "the," "here," and "there" often pose considerable difficulty for many children. If we accept the premise that reading materials should be based on the language which is familiar to the child, then beginning reading should examine the phonemic pattern of the beginning reader. Thus, difficult or nonexistent phonemes may be postponed.

Syntactic Models. Syntactic models involve both the concepts of surface and deep structure. In the study of reading, the emphasis on deep structure gives rise to increased emphasis on reading for meaning. Smith (1971) noted that reading for meaning entails making use of information from both the surface and deep structural levels of language. In his model, Smith (1971) proposed possible processes which are utilized in beginning and fluent reading. He pointed out that beginning reading is characterized by mediated processing, whereas fluent reading is characterized by immediate processing. According to Smith, reading always begins with distinctive features. At this time, the exact nature of the distinctive feature is debated. Smith maintained that a pupil can't be told what is a distinctive feature; he must decide that for himself, either consciously or unconsciously. However, Furukawa and Sunshine (1974) have investigated the distinctive features of lower case letters and have found that six-year-old children instructed in the chunking of distinctive features performed better on pre-test and post-test gain scores and on one-week delayed post-test scores than a peer group instructed by an operant method.

Although the identity of a distinctive feature is still not clearly known, many believe that it is the discrimination of such features which permits a reduction in the number of alternative letters or words that a configuration might be. In mediated word identification, the beginning reader must first discriminate for himself the distinctive features of letters, and then build to word identification. This building process involves the formation of categories. "Each category is specified cognitively (in the minds of the reader) by descriptions that determine which configuration may be allocated to that category (Smith, 1971, p. 7)." These descriptions are called feature lists. In immediate identification, the reader has feature lists that permit allocation of a configuration to a named word category. However, in the absense of feature lists, mediated processing builds the word category (and word name) through procedures utilizing letter feature lists (e.g., sounds).

Finally, there is a distinction between immediate and mediated comprehension in Smith's model. Mediated comprehension is through identification of individual words. On the other hand, immediate comprehension depends not only on immediate word identification, but also on the knowledge the reader has built up during his reading experience of the pattern of words and letters. If this knowledge is not mastered, mediated comprehension must occur and the reader can still not be characterized as fluent. Fluent readers must process the surface structure and assimilate the content into previously accumulated experiences. Generally, the actual words used are not retained in long-term memory, but the meaning is. Instructional methods which emphasize word and letter identification to the exclusion of meaning are missing the

point, which is this: the fluent reader learns to read with a minimum of visual information from which to reconstruct the meaning.

Although the processes by which immediate meaning identification is accomplished are not completely understood, two points may be made. First, fluent readers use mediated meaning identification when the material being read is unfamiliar or difficult. That is, they identify and repeat individual words, sometimes aloud, in order to reconstruct meaning. This is what the poor reader does all the time, either because the material is too difficult or because he does not have the background to make the message meaningful. Second, reading, like any other process, becomes proficient with practice. As Smith noted:

> Learning to read is akin to any other skill; there are perhaps some specialized exercises that one can undertake to iron out particular difficulties, but there is no substitute for engaging in the activity itself. Reading involves looking for significant differences in the visual configuration to eliminate alternatives, and knowledge can be acquired of the differences that are significant only through experience . . . . It has to be acquired; the major contributions that the teacher can make are to provide information, feedback, and endouragement (Smith, 1971, p. 209).

Since the syntactic models emphasize meaning, grammatical concepts must be included in their models of reading. The child whose language has a different grammatical structure will experience difficulty understanding a passage with unfamiliar structures unless he has experienced similar structures in the speech of adults around him. Although written passages of an idea are structured differently than the same idea conveyed in speech, there

are many points of similarity. For example, the speech heard in middle-class homes and the reading material encountered in the school are highly similar. The child is able to capitalize on these similarities as he begins to process into a deep structure. Children coming from homes where an English dialect is spoken need several years in experiencing standard English before beginning to read. Those models do not assert that the child needs to speak standard English, only that he can understand speech in this mold. Further, this does not imply that children speaking a dialect should be made to feel inferior by correcting their speech. The theories only imply that standard English needs to be understood and processed.

Semantic Models. Semantic models deal with the readers use of context clues to derive meaning from the printed word. Goodman (1970) asserted that readers use their knowledge of the grammatical constraints of the language and their knowledge of word meaning to reduce the probable alternatives of what follows next in the passage. Again, this implies that the readers must have experience not only with the language in print, but also in everyday life. For example, poor readers stumble over phrases such as "Once upon a time" which should trigger immediate meaning.

Goodman (1970) has analyzed the kinds of errors readers make when attacking material which is slightly difficult. He found that not all "errors" should be regarded as not knowing something or as being careless. Many so-called errors are really processing deviations. Children should be encouraged to form hypotheses based on the structure and content of a passage and to use visual cues to test the accuracy of these hypotheses. If the child is reading for meaning, then the passage will provide corrective feedback by indicating when

a sentence is meaningless. Conversely, the child reading solely for identification of words will proceed reading through a passage without realizing that what he is reading is nonsense.

Goodman suggested that the child may learn about language knowledge through word games which require using clues and meanings to predict words that are next in context. For example, the child might be given the beginning of a sentence and asked to complete the sentence in as many ways as possible. Or, the child might be given a sentence in a paragraph with a word missing and asked to supply the missing word. They need to be taught to search the surrounding sentences for clues to the missing word. The first clue to look for may be the tense in which the total passage is written. The child would continue his search until he was able to determine the correct word. This technique could be used with various aged children and with materials of increasing difficulty.

Information-Processing Models

Information processing models have provided many useful concepts in the study of reading. These models have contributed the concepts of bits or chunks which is a group of stimuli (e.g., lines, letters, words). Probably, the content of a chunk will vary according to the learner's stage of development (Furukawa & Sunshine, 1974). In addition to the notion of chunk, the concept of redundancy is important in this model. Since there is more information in the message (oral or written) than is really necessary for comprehension, the message must be broken down into relevant and irrelevant stimuli. This suggests that children should look for semantic and syntactic patterns, as well as visual patterns, which will help reduce the number of

alternatives. These patterns involve redundancy, in that not all of the information from the three patterns is necessary for meaning. For example, given the beginning of a sentence on the bottom of a page such as "The boy did not know how to do his home--," it is easy to complete the sentence by relying on either semantic or syntactic or visual information. The reader can turn the page and rely on visual information; the reader can rely on syntactic clues by supplying endings which are compound nouns beginning with the word "home;" or the reader can rely on semantic information which dictates the kind of "home--" that one does not know how to do. All of these sources of information provide overlapping information (i.e., redundant information.) Fluent readers make use of all the sources of information, more so than less fluent readers.

Summary

Even a cursory examination of the models presented here reveals that there are many views of reading acquisition. Although each orientation is based upon a different psychological and educational viewpoint, each advocates definite but often different implications for the teaching of reading. Because of these differences, it is impossible to develop one sure cure for all reading problems. In general, the teacher must decide upon an orientation (model or congruent models) and follow the implied teaching route.

Section III: Practical Implications

The models and research mentioned in the prior chapters suggest some practical implications for instruction. Although present findings often may be contradictory, a number of common elements can be deduced which should be considered in the development of the total reading program. It is important to note that there is no one method which will contain all the important elements; therefore, the total program will need to include various methods during different developmental reading stages and for different children. The teacher will need to consider the following elements when planning the classroom reading program.

The Elements of Reading Progress

1. Forcing the Reader. Anyone trying to force young children through a rigidly prescribed reading routine often will frustrate himself and the children. When children are released from such restricted teaching practices, they often learn to read more easily. For example, although most children in the elementary school learn to read at some level, some, despite all efforts, never read more than at a minimal level. These same children, however, may be able to read material that interests them (e.g., comic books) amazingly well. In general, young children learn to read without pressure and over-structured instruction. This does not mean a structured program is not useful, but a program which insists that all children must go through a prescribed series of minute steps, all at the same time, may prove detrimental to some individuals.

For an instructional program to be successful, it must account for the individual's level of cognitive development by adjusting the degree of abstraction necessary in encountering the writing system. Some children initially will require that the teacher record their personal experiences in print as a means of developing the notion that writing represents speech. Later emphasis on sound-letter correspondences may be introduced best to some children by using familiar concrete objects with initial sounds that correspond with manipulative letters that can be used to build words. On the other hand, more advanced youngsters can use spelling-pattern/sound-pattern correspondence using familiar vocabulary. When determining which method to use with an individual reader, it is important to remember that the act of decoding requires the child to use reversible operations and to reorganize the incoming

written stimuli. Therefore, if a reader is to be successful with a spelling-sound decoding technique, he must be able to use the processes or operations of analysis, reorganization, and synthesis of decoding units (except for decoding emphasis on sight vocabulary). Only children in the Piagetian concrete operation stage can use such processes. The concrete operations stage generally is reached by the age of six or seven. Perhaps, for many children, formal reading instruction with a decoding emphasis (other than sight vocabulary) could be postponed until the child can use the required operations.

A consistent finding from the research by Piaget and his followers is that we cannot accelerate the child into various mental stages. This same generalization can be applied to reading. We cannot accelerate reading progress by over-emphasis. It appears at this time that we cannot train children to perform decoding tasks by using diagnostic and prescriptive cure-alls. Although we can diagnose that a child may be deficient in certain operations, such as matching or sorting, researchers believe that a child who is not cognitively ready to perform such tasks cannot be trained to do so. The Piagetian research does not indicate, however, that children under six cannot learn to read. But, two speculations concerning early readers can be made: (1) early readers possess the mental operations associated with the concrete stage of development; and (2) training procedures (diagnostic-prescriptions for skill weaknesses) may help early readers or any reader, but only if the child is cognitively ready and merely needs the training experiences.

In summary, it is important to remember that learning to read should be an enjoyable, not an onerous task in which teachers and parents apply intense pressure. As Gibson (1970) noted, "Reading should be a consummatory activity

that functions as its own incentive and reward because of the appeal of the information to be picked up . . . finding an answer to a practical question can do this (p. 5)." As the individual confronts the reading task, his motivations should be persistent. Generally, an emphasis on the total language arts area (listening, spelling, and writing) will help to develop and maintain an interest in reading-language learning. It may well be that we are taking away valuable time from other learning activities which will contribute to the reading-language experience by making the young child spend one to two hours each day in learning to break the code. Such practices need serious evaluation.

2. Developing the Cognitive Structure. A well-developed cognitive structure is absolutely necessary if one is to read for meaning. A wide variety of experiences is helpful. Since the young child is an assimilator of the information around him, he constantly questions, explores, and translates meaning. The teacher can channel these interests during this period of the child's life by using many concrete experiences with the child. There are other media besides the printed media which can help the young child to acquire knowledge at his own pace. Television programs, video-tapes, demonstrations, and field trips all can provide information and hold the child's interest. These media can provide experiences in observing and relating spoken material to action. Furthermore, story-telling or verbal relaying of information offers the child experience in developing a topic, in hearing and speaking the language and its transformations, and in developing images. These media can be used in any subject area to develop knowledge and the child's cognitive structure.

3. Relating Sight Words, Phonics, and Spelling to Reading. These related elements are important aspects of learning to read, but not necessarily important components of the total reading program of instruction. Word recognition can be taught directly through drill and practice, but it also can be taught indirectly. For example, even the young child likes to read road signs. If name tags or signs are placed on items within the classroom, children quite willingly associate the printed symbol with the article. Pupils will be more motivated to play such reading games than participate in word drills.

Phonics appears to be most helpful to persons who already read, rather than to one who is beginning to read. Furthermore, the child's inability to grasp the numerous phonetic rules easily needs to be considered. These are two good reasons for postponing the teaching of visual phonics until after the child has begun to read. The second or third year of school might be an appropriate time to begin visual phonics (opinions vary). Because we know more about the teaching of phonics than many other teaching techniques, teachers also are able to reach their objectives efficiently. However, phonics should not be confused with reading, but should be considered an aid for the more advanced reader. Phonics is useful in all language arts--spelling, writing, and speaking. Its function should neither be restricted to reading nor should it interfere with the teaching of initial reading skills.

Di Vesta (1974) suggested that phonics be taught as a part of spelling. By combining the two, the teacher can make the best use of the linguist's contribution to the understanding of word construction. Characteristics of letters and words can be elucidated for quick recognition. However, when

phonics is included in reading, the learner's task is complicated.

In summary, a system for word recognition must be developed for use throughout one's lifetime. From the earliest stage of learning to read, the child should learn that words can be decoded by the use of many clues--picture, context, structure, phonics, and by being told. The use of these clues must be combined into a workable word study strategy. Such a strategy cannot be segmented and practiced as a series of separate skills. On the contrary, the skills should be practiced and integrated as a total lifetime strategy.

4. Developing Comprehension Processes. The comprehension of speech of written material involves the use of language and thought--language which involves the combination of words into structured sentences to express ideas and the combination of sentences into paragraphs to express related ideas and thoughts. The child cognitively manipulates the ideas he reads based on his reading or listening purpose (Ruddell, 1974). Looking, listening, speaking, reading, and writing all involve comprehension, with looking, listening, and speaking aspects developing before reading and writing aspects.

Since the beginning reader's oral language performance is fairly good, he should be led from the oral language he knows to the written form that he needs to know. Writing shows how the oral language of a speaker can be represented. One method to develop this notion, the language experience approach, was suggested earlier by Huey (1908). There is no one language approach, although most of the language techniques involve having the child write short stories about his own experiences and, later, either read them

aloud or combine the stories into books or both. This method appears to be a natural bridge between the listening-looking stages of comprehension and the reading-writing stages. Pressure is reduced for the young child with this method, while meaningful reading material written in the child's own language style is provided. Also, this method frees the beginning reader from depending solely on his knowledge of sound-letter relationships. He learns that he can begin to rely more and more on what is known as the underlying linguistic structure. This structure enables the beginning reader to avoid misreading a word such as "dog" as "gdo," an impossible phonological relationship in English. Additionally, the child learns to realize that he can rely on his cumulative knowledge of how spoken language works to anticipate the message of the written page.

To this point, we have focused primarily on one type of meaning, relational meaning (i.e., the meaning carried by the structural components that underlie our system of language). We must also be concerned with lexical meaning (i.e., conceptualization of experiences and the arbitrary labeling system that enables us to represent these experiences). In addition, the child must be able to interpret information at the factual level as literal meaning is derived; at the interpretative level as content is modified and understood; and at the applicative level as information is transformed and applied in new situations. Comprehension at each of these levels may be directed by specific questioning, such as finding the main idea or identifying causes and effects as influenced by the individual reader's cognitive structure.

A major goal in designing classroom comprehension experiences is the development of children's interpretive skills and cognitive structure to help

them answer and ask questions as well as find and prove answers. These classroom strategies range from focusing types, which direct attention (e.g., What problems did the Smiths have?), to raising types, which intend to obtain information on a higher level (e.g., How would you solve the problem?). Questions can clarify information and encourage the child to involve higher thinking processes as the why of a process is considered. In brief, teaching children to ask questions can guide thinking through setting purposes which allow the reader to search for information. This information may either answer the purposes or initiate further questions.

Taba (1967) believes that the teacher, through questioning strategies, elaboration and integration of ideas, feedback, and reinforcement, can influence the critical thinking of the young child. Similarly, Wolf, King, and Huch (1967) found that questions characterized as interpreting, analyzing, applying, and evaluating produced higher response levels than did specific fact or classifying-type questions. They found that children at all school ages can be taught to comprehend at all levels of thought. The key to comprehension is the questions raised by the reader and the author.

In general, questioning strategies play an important role in five sources of language-influenced cognitive development:

1. Words; "invitations to form concepts" for the child who encounters unfamiliar labels and is curious about their meanings.

2. Dialogue between child and adult; a basic source of concept development and experience orientation.

3. School environment; creates the need for a different functional variety and use of language.

4. Scientific concepts; may be unique to a culture and conveyed verbally.

5. Conflict between modes of representation (action, imagery, and language); may enhance intellectual development through contrast and abstraction of concepts (Bruner, Goodnow, and Austin, 1966, p. 87).

5. Considering Syntax. If the child is going to learn to read by the use of the basal reader, the child's syntax should be more carefully considered. Most basal readers contain stilted sentences that no child would use. For example, Shuy (1973) noted that research in the oral language of children indicated few sentences beginning with prepositional phrases. Thus, a prepositional phrase at the beginning of a sentence might better be placed as part of the previous sentence. In general, sentence patterns that are neither too elementary nor too complex for the young reader should appear in readers.

Beginning readers also could be better presented to the young child if they would use slight indentation on alternate lines so as to help the reader keep his place while reading down a page (Huey, 1908). A recommendation (Sunshine, 1975) could be made (even more strongly) to present phrases as meaning units (e.g., to the store) instead of irregular phrases (to the store). Similarly, the young reader's attention is captivated by line drawings like those in comic books (Huey, 1908). The young reader is often overwhelmed by complicated pictures which do not seem to correspond to his experiences (Samuels, 1973).

6. Developing Practical and Purposeful Reading. The child is constantly bombarded with words and directions which require the reading of messages, such as road signs, advertisements, directions on a pay phone, or filling out

a form for a hotel. There is no order from easy to hard as far as which aspect of functional reading must be mastered first. For instructional purposes, specific levels at which survival reading behaviors are introduced, reinforced, and mastered should be stated. That is, street signs could be introduced at age 6, reinforced between ages 6 to 11, and mastered at age 12. For most students, the functional reading objectives could be met through the integration of the objectives into the approach presently being taught. Specific skills could be taught with the use of functional materials. For example, the use of the phone book could be used in learning to alphabetize. Functional materials could provide the stimulus for the language experience approach. Another means of incorporating the functional reading objectives into the total program could be by using specific units which would be developed into a set of objectives, such as the reading of road signs. Finally, as noted in the discussion of "relating sight words, phonics, and spelling to reading" in this chapter, functional words such as table, cabinet, or sink could be labeled and, later, games associating the item with the label could be played. Functional reading materials often can provide the stimulus to develop reading skills which have not been developed previously.

7. Encouraging Personalized Reading. As noted in the previous sections, one goal of the reading-language program is to help children learn to decode, encode, and comprehend the written message. Another is to help them realize literary as well as literacy goals. To this end, reading should provide the child with a means to: (1) identify similarities to one's self and others through story characters; (2) vent emotions by living through a story character; and (3) perceive one's inner nature through gaining insight about a character's

behavior. The skills needed in the developmental processes of reading are different from those needed for information, pleasure, and personal development. Most good reading selections serve many of these purposes; that is, a developmental selection may expand a child's vocabulary, add to or reinforce certain concepts, employ a variety of syntactical patterns, and provide possibilities for building comprehension. Other selections seem to have special capabilities in certain areas, such as development of a story character having personal problems similar to the reader's. Regardless of the selection chosen, it will not appeal to all children. Thus, a variety of materials, both print and non-print, should be utilized in any program to motivate the child to encounter the world of the written message.

8. Accomplishing Declared Reading Goals. In the final analysis, the success of the reading-language program in achieving instructional objectives is the result of the teacher's development and implementation of instruction. However, the teacher must first decide what to teach by examining what is currently known about the reading process (see Chapters I and II). After goals are declared, and teaching techniques for implementing the goals have begun, the teacher must be willing to critically examine the effectiveness of the program for all children. Furthermore, provisions for individual children may require a teaching approach other than that presently utilized. For example, a synthetic phonic approach used to build a word recognition system may be effective for building decoding skills for some students, but less effective for others, in which case a different method will need to be employed. Once an effective method is implemented for a given child, it should be used systematically and consistently. The decision as to which method to use can

only be made by the classroom teacher. It can only be made after the careful consideration of the instructional materials available with an understanding of the various approaches to reading-language instruction, and, even more important, with an understanding of the reading-language processes of each child.

No matter how different students are, the reading program must have declared goals and objectives so that the instructional program has a purpose. Since there is no magic for all students, a comprehensive and balanced set of goals appears sound. Such a program is the basis of the declared reading goals for all students. The choice of skills for each goal may vary according to the student. However, a comprehensive and balanced reading program should have five major goals for developing teaching strategies and learning activities. The five major goals are:

1. UTILIZE A VARIETY OF READING MATERIALS

   In this goal, a student identifies his own purposes for using reading materials, and, from a wide variety of available materials, he selects those which are suitable in level of difficulty and in content. Such materials include both print (e.g., books, newspapers, periodicals, vertical files, documents) and non-print (e.g., films, records, transparencies, maps, globes, charts).

2. USE A WORD RECOGNITION SYSTEM

   The achievement of this goal enables a student to perform two tasks which are basic to success in reading. First, he knows and can apply a system for recognizing unfamiliar words. Secondly, he can instantaneously and simultaneously pronounce words and determine their meaning in a particular context. Such a system includes authority (i.e., glossary, dictionary) clues.

3. COMPREHEND VARIOUS READING MATERIALS

To accomplish this goal, the student must think literally, critically, and creatively about the intent of the communication. Thus, the student must develop a method for using the pattern of thought in the message in order to understand the meaning and to draw inferences. In this process, he uses his own experiences and knowledge about the content to ask a variety of questions and to find suitable answers to these questions.

4. MEET THE READING DEMANDS FOR FUNCTIONING IN SOCIETY

This goal prepares the student to survive in society by helping him to cope with everyday reading experiences (i.e., following directions, locating references, gaining information, understanding forms, and attaining personal development). Since it establishes a minimal performance level for students, this goal is of prime importance.

5. SELECT READING AS A PERSONAL ACTIVITY

The essence of this goal is the student's personal enjoyment and appreciation of the reading process whereby he <u>can</u> and <u>does</u> read. The development of such a positive attitude must not be left to chance, but, instead, it must include the continuous building of reading interest, desire, and habit as an integral part of all reading instruction throughout the State.

Of course, for each school system, school, classroom, and child there will be stated goals which are more specific and individually appropriate. All of the goals will probably be a part of the previous stated ones. Most important to remember is that regardless of the specific objective or goal to be achieved, the total goal of the reading program, K-12, is to develop strategies for a lifetime of reading.

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